

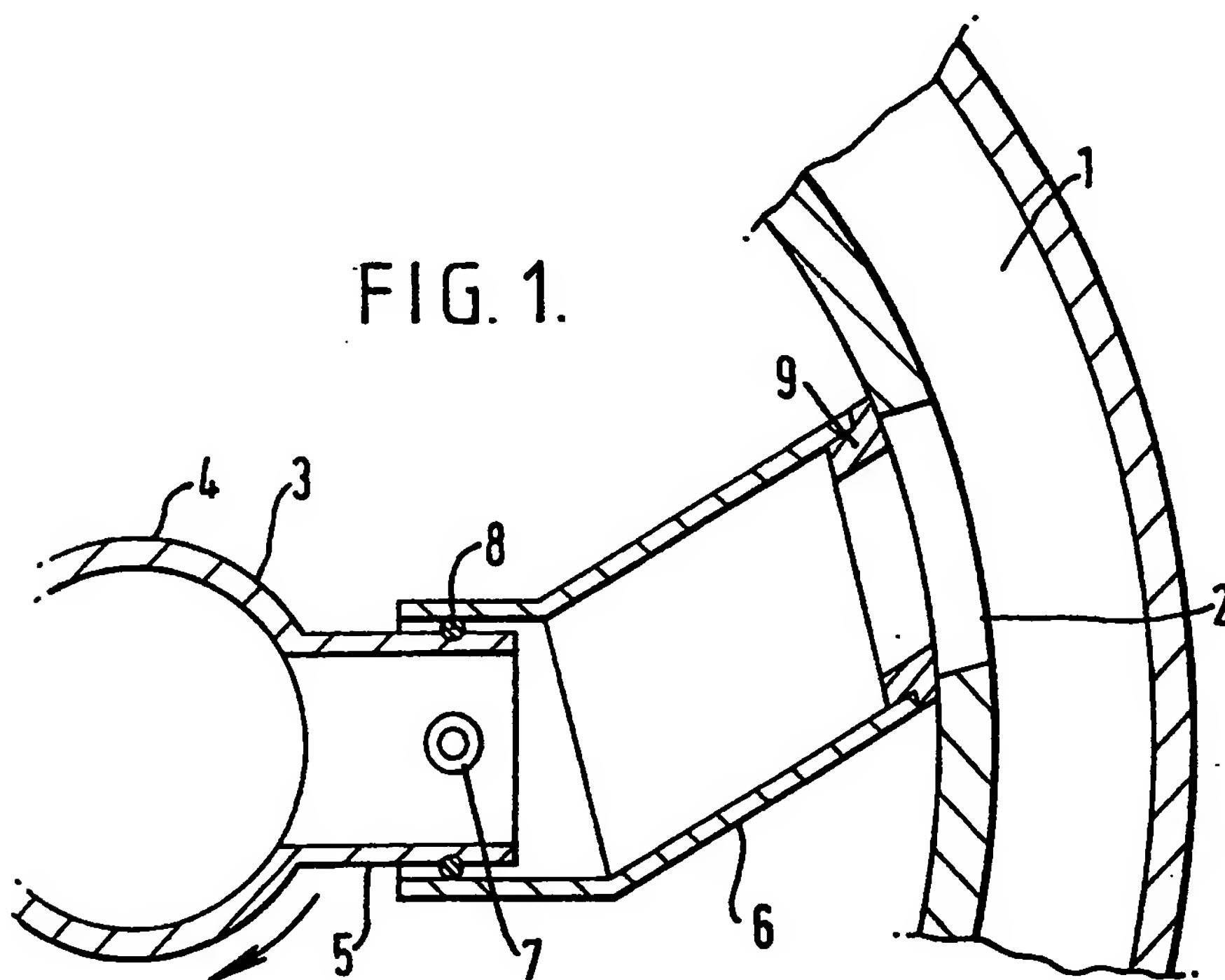
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(71) Applicant	(56) Documents cited
Swinney Engineering Limited (United Kingdom), 26 Dacre Street, Morpeth, Northumberland, NE61 1HR	None
(72) Inventors	(58) Field of search
Denis Percy Swinney, Norman Twizell	B1D
(74) Agent and/or Address for Service	
Withers & Rogers, 4 Dyer's Buildings, Holborn, London EC1N 2JT	

#### (54) Backwash filter

(57) A filter has an inlet for fluid to be filtered, and outlet for filtered fluid and a cylindrical filter body 2 between the inlet and the outlet. A backwash means 3 for backwashing the filter body 2 by reverse flow of the filtered fluid is positioned within the filter body 2 and includes a backwash duct 4 for removal of the backwashing fluid and at least one backwash head 6 pivoted by pin 7 to the backwash duct 4. The backwash head 6 is biased into engagement with the filter body 2 such that, upon relative movement between the head 6 and the body 2, the head 6 sweeps the body 2, the pivotal mounting absorbing irregularities in surface contour.



# FIG. 1.

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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FIG. 1.

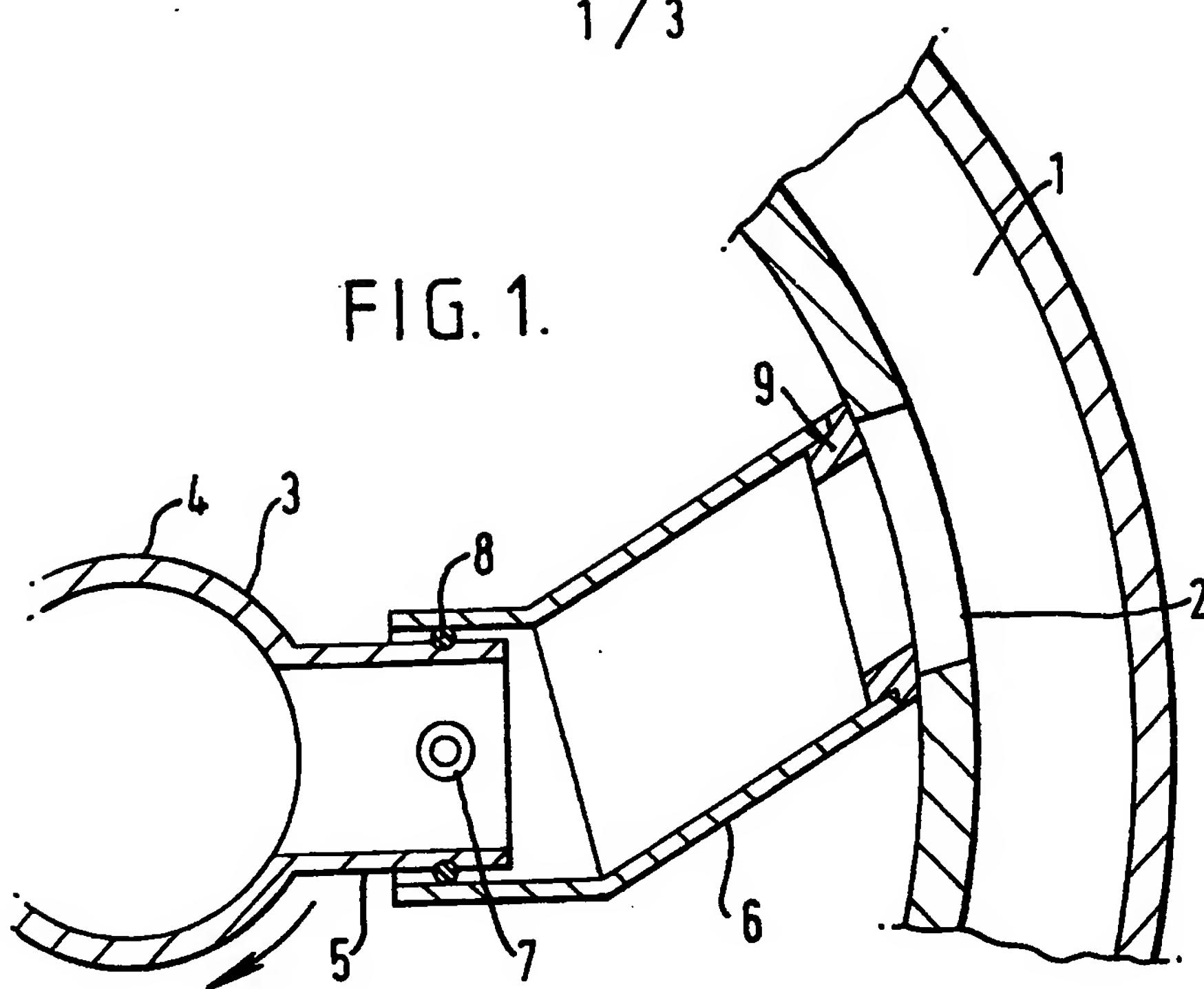
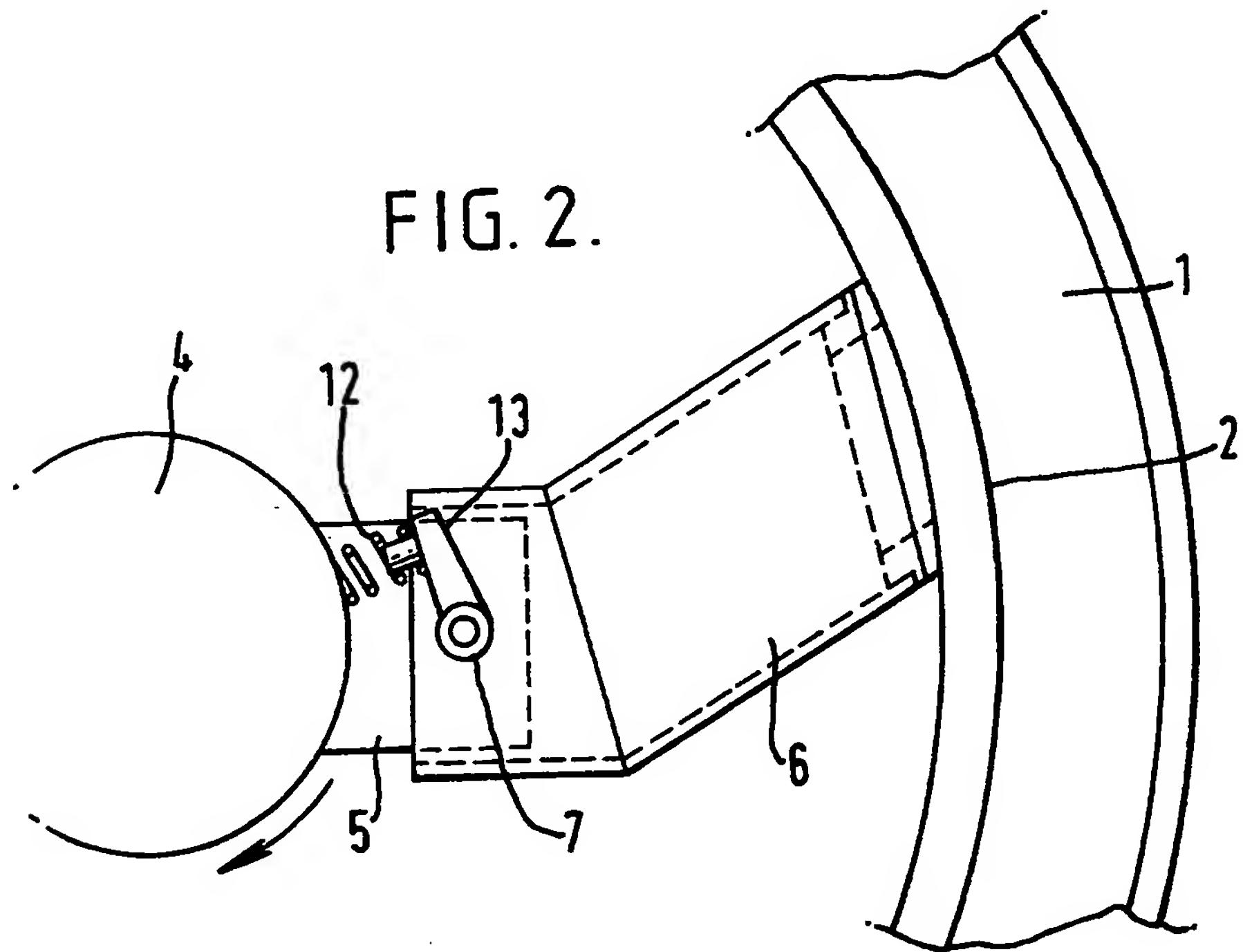
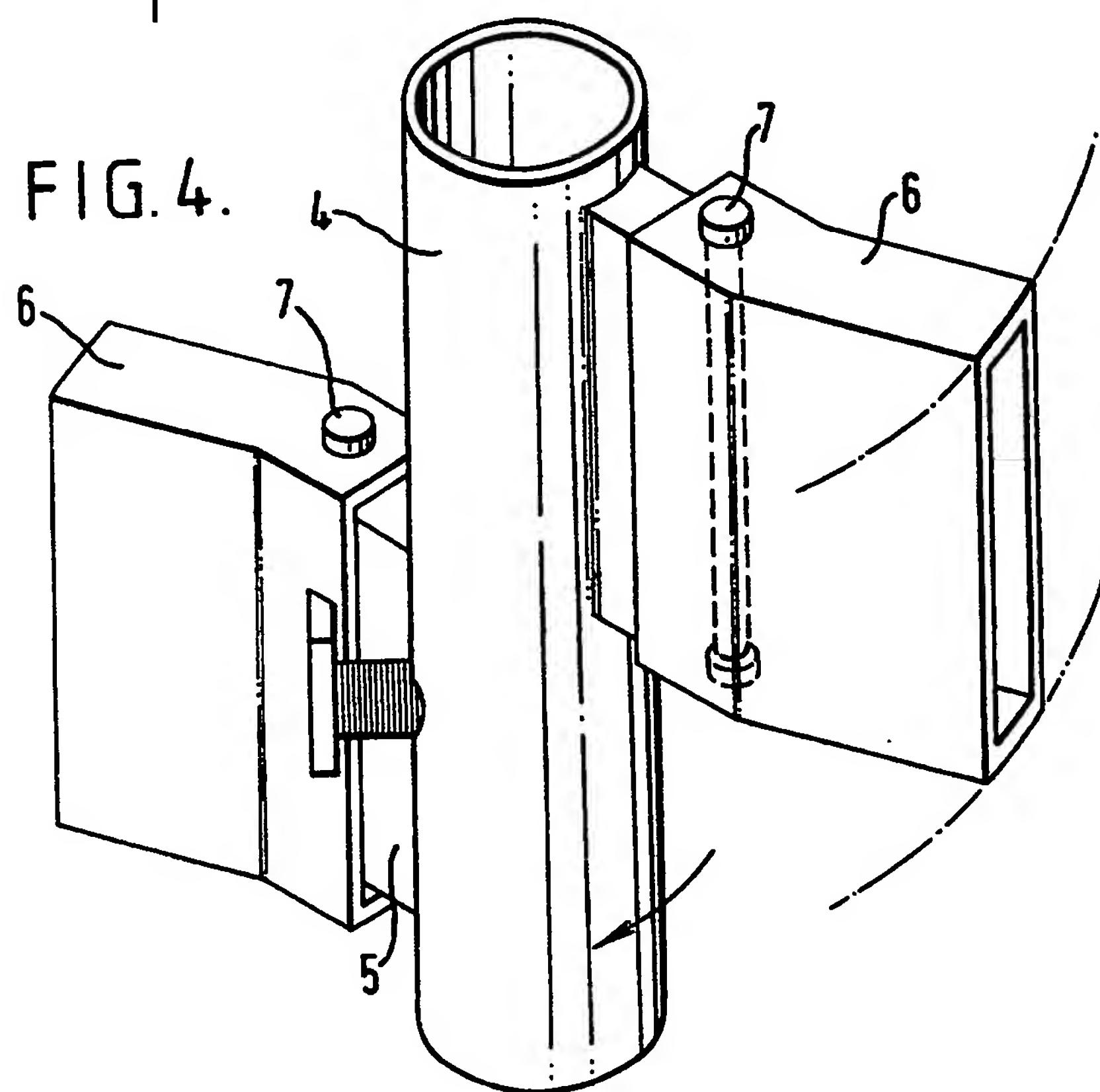
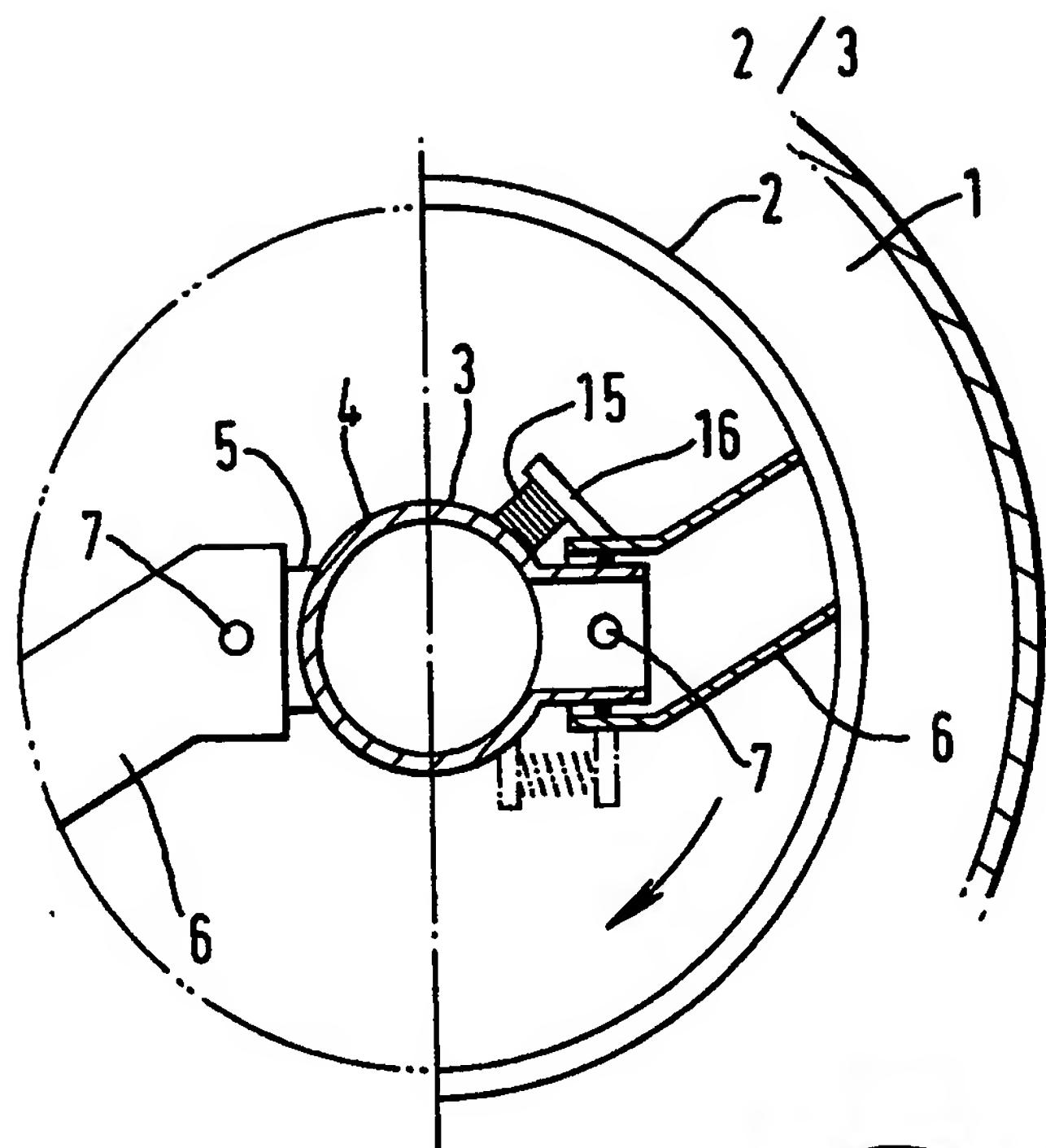


FIG. 2.

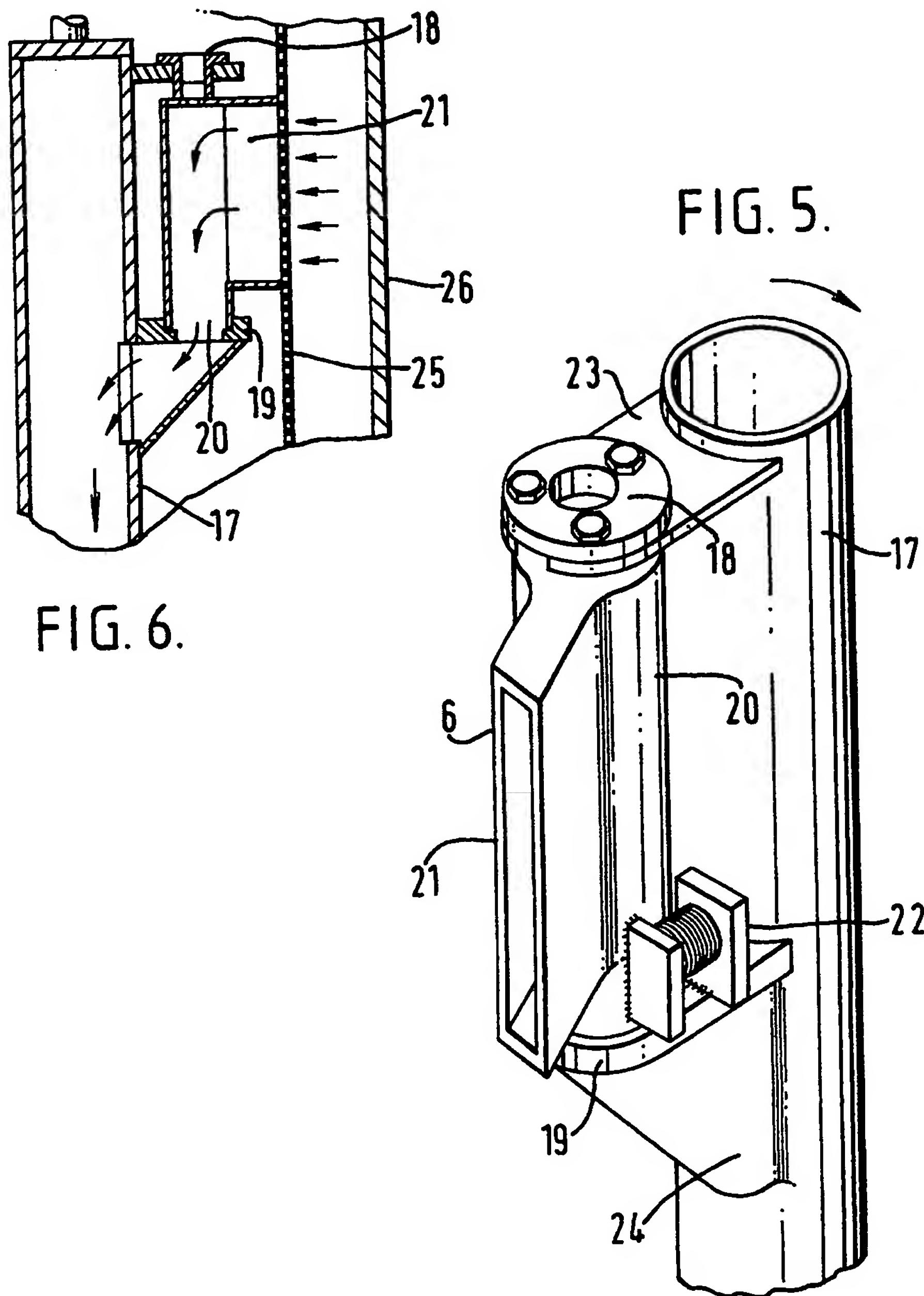


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SPECIFICATION  
Improved filter

This invention relates to an improved filter.

In British Patent Specification 1485989 there is disclosed a cylindrical filter which is backwashed by means of a rotatable backwashing means within the filter which carries a number of backwashing heads which sweep the internal surface of the drum so as to clean the filter. The heads are radially positioned and are biased against the filter.

We have now designed an improved filter which provides smoother contact between the relatively moving surfaces and is also less liable to jamming with particles backwashed off the filter element.

According to the present invention there is provided a backwash filter comprising an inlet for fluid to be filtered, an outlet for filtered fluid, a filter body between the inlet and the outlet, and backwash means for backwashing the filter body by reverse flow of the filtered fluid, the backwash means including a backwash duct for removal of the backwashing fluid and a backwash head pivoted to the backwash duct and biased into engagement with the filter body such that upon relative movement between the backwash head and the filter body the backwash head sweeps the filter body, the pivotal mounting absorbing irregularities in the surface contour of the filter body.

More particularly the invention includes an automatic backwash filter comprising a cylindrical filter body, an axial backwash duct rotatably mounted within the filter body, and at least one backwash head carried by the backwash duct and arranged to sweep the filter body upon rotation of the backwash duct, the backwash head being pivoted to the backwash duct and biased into engagement with the filter body.

Preferably the backwash head is pivoted to a radial extension of the backwash duct and is arranged to adopt a trailing position with respect to the direction of rotation of the backwash duct. The biasing means may be a rubber or mechanical compression spring on the trailing side of the backwash head or a tension spring on the leading side. If desired a plastic nose seal may be provided at the free end of the backwash head for engagement with the filter body. There may be any suitable number of backwash heads for the filter body. Where there are more than one backwash head they may be angularly spaced about the backwash duct and may be axial adjacent or overlapping.

The invention will now be described by way of example with reference to the accompanying diagrammatic drawings in which:

Figure 1 illustrates a partial plan view of a first embodiment of the invention;

Figure 2 illustrates a partial plan view of a second embodiment of the invention;

Figure 3 is a plan view of a third embodiment of the invention;

Figure 4 is a perspective view of the embodiment shown in Figure 3;

Figure 5 is a perspective view of a fourth

65 embodiment; and

Figure 6 is a part sectional view of the backwash means shown in Figure 5.

In Figure 1 of the drawings a filter 1 comprises an elongate cylindrical filter body 2 (only partly shown) and a backwash means 3 within the filter body arranged, by known means such as a motor (not shown), to rotate within the filter body 2. The backwash means 3 consists of an axial backwashing duct 4 having one or more short radial projections 5.

70 A backwashing head 6 is pivoted, by pivot pin 7, to the or each projection 5. The backwashing head 6 is inclined relative to the respective radial projection 5 so as to adopt a trailing position relative to the direction of rotation and is arranged so that its free end sweeps the internal surface of the filter body 2. Seals 8 and 9 are provided at each end of the head to seal against the projection 5 and the filter body 2 respectively. The seals 8 are sufficiently resilient to bias the backwashing head 6 into an angular 85 forward position whilst accommodating minor variations in the internal surface contour of the filter body 2. Alternatively a small spring (not shown) may be used to provide resilient bias.

In the embodiment of Figure 2 similar parts to 90 those in Figure 1 have been given the same references. This embodiment is designed to accommodate larger changes in the internal surface contour and therefore a spring 12 is provided which acts upon a lever 13 at the pivot 7 to bias the 95 backwashing head 6 into an angularly forward position relative to the direction of rotation of the backwashing means 3.

In Figures 3 and 4, again the same reference numerals have been used where appropriate, an 100 alternative arrangement is disclosed where a rubber or mechanical compression spring 15 acts upon a trailing extension 16 of the backwashing head 6 itself. Alternatively the bias could be provided by a tension spring acting upon the leading side of the 105 backwashing head 6. A plastic nose seal may be fitted to the free end of the backwashing heads 6 although not shown.

In use, the apparatus of the first three 110 embodiments, fluid to be filtered passes to the interior of the filter body 2 and passes through the filter body 2 to an outlet not shown. In order to clean the filter body 2, the backwashing means 3 is rotated and is arranged to provide a pressure differential at the backwashing heads 6 such that filtered fluid on 115 the outside of the filter body 2 is drawn back through the filter body 2 at those parts aligned with the backwashing heads 6. This action causes debris trapped in the filter body 2 to be released from the filter body 2 and carried, via the axial backwashing duct 4, to waste. In the fourth embodiment of the 120 invention shown in Figures 5 and 6 a rotatable backwash duct 17 has an upper extension 23 carrying a bearing 18 and a lower extension 19 which forms a hollow bearing and also provides a 125 passage 24 into the main backwash duct 17. Between these bearings is provided the backwash head 6 which comprises a tube 20 open at the bottom and closed at the top to which is fixed a rectangular extension 21. The backwash head trails

against the filter body 25 and is biased against it by means of a spring or rubber block shown at 22. In this embodiment the liquid flowing from the filter vessel 26 through the filter body 25 to backwash it 5 passes into the trailing extension 21, down the vertical tube 20 to the hollow bearing 19, and so into the main backwash duct 17 going out of the filter body 25 to waste.

The provision of inclined trailing backwashing 10 heads 6, which are pivoted to the axial backwashing duct 4, allows the heads to more readily absorb irregularities in the internal surface contour of the filter body whilst being biased into an angularly forward position against the filter body 2. This 15 arrangement is particularly advantageous where the filter body 2 is a felt type wrap-around filter element where there is not a rigid element carrier but rather a rolled perforated plate or a cylinder of wire wound material.

## 20 CLAIMS

1. A backwash filter comprising an inlet for fluid to be filtered, and outlet for filtered fluid, a filter body between the inlet and the outlet, a backwash means for backwashing the filter body by reverse flow of 25 the filtered fluid, the backwash means including a backwash duct for removal of the backwashing fluid and a backwash head pivoted to the backwash duct and biased into engagement with the filter body

30 such that, upon relative movement between the backwash head and the filter body the backwash head sweeps the filter body, the pivotal mounting absorbing irregularities in the surface contour of the filter body.

2. A backwash filter according to claim 1 wherein 35 the filter body is cylindrical and the backwash duct is rotatably mounted axially within the filter body.

3. A backwash filter according to claim 2 wherein the backwash head is pivoted to a radial extension of the backwash duct and is arranged to adopt a 40 trailing position with respect to the direction of rotation of the backwash duct.

4. A backwash filter according to claim 3 wherein the biasing means is a compression spring on the trailing side of the backwash head.

45 5. A backwash filter according to claim 3 wherein the biasing means is a tension spring on the leading side of the backwash head.

6. A backwash filter according to any one of the preceding claims wherein the backwash head 50 includes a plastics nose seal for engagement with the filter body.

7. A backwash filter according to any one of the preceding claims 2 to 6 wherein there are a plurality of backwash heads angularly spaced about the 55 backwash duct.

8. A backwash filter substantially as herein before described with reference to and as illustrated on the accompanying drawings.